What is claimed is:

1. A method for encoding image data in conformity with Joint Bi-level Image Group system, comprising the steps of:

(a) determining whether or not a typical prediction should be performed;

(b) if a result of determination at step (a) is negative, determining whether or not all the pixels in a region composed of lines including pixels constituting a context are white;

(c) if a result of determination at step (b) is affirmative, determining whether or not a predicted value corresponding to a context of which all the pixels are white is white;

(d) if the result of determination at step (a) is affirmative, performing a first single line encoding process;

(e) if the result of determination at step (b) is negative, performing said first single line encoding process;

(f) if a result of determination at step (c) is negative, performing said first single line encoding process; and

(g) if the result of determination at step (c) is affirmative, performing a second single line encoding process.

2. The method according to claim 1,

wherein said first single line encoding process comprises the steps of:

(d-1) forming a context for each pixel in a target line;

(d-2) reading from a probability estimation table a range width for prediction-miss which corresponds to the context formed at step (d-1);

(d-3) updating a range width showing probability that combination of white and black appears using said range width for prediction-miss;

(d-4) predicting a value of each pixel in said target line on the basis of the context corresponding to the pixel;

(d-5) if the prediction is unsuccessful, performing a prediction-miss process for the pixel concerned; and

(d-6) if the prediction is unsuccessful, performing a normalization process for the pixel concerned.

3. The method according to claim 2,

wherein first single line encoding process further comprises the steps of:

(d-7) if the prediction is successful, determining whether or not a normalization is necessary for each pixel in said target line;

(d-8) if a result of determination at step (d-7) is affirmative, performing a prediction-hit process for the pixel concerned; and

(d-9) if the result of determination at step (d-7) is affirmative, performing said normalization process for the pixel concerned.

4. The method according to claim 1,

wherein said second single line encoding process comprises the steps of:

(g-1) forming a context of which all the pixels are white and which is common to the pixels in a target line;

(g-2) reading from a probability estimation table a range width for prediction-miss which corresponds to the context formed

at step (g-1) ;

(g-3) updating a range width showing probability that combination of white and black appears using said range width for prediction-miss; and

(g-4) omitting to predict a value of each pixel in said target line.

5. The method according to claim 4,

wherein said second single line encoding process further comprises the steps of:

(g-5) determining whether or not a normalization process is necessary for each pixel in said target line;

(g-6) if a result of determination at step (g-5) is affirmative, performing a prediction hit process for the pixel concerned; and

(g-7) if the result of determination at step (g-5) is affirmative, performing said normalization process for the pixel concerned.

6. A computer program product for having a computer execute a method for encoding image data in conformity with Joint Bi-level Image Group system, said method comprising the steps of:

(a) determining whether or not a typical prediction should be performed;

(b) if a result of determination at step (a) is negative, determining whether or not all the pixels in a region composed of lines including pixels constituting a context are white;

(c) if a result of determination at step (b) is affirmative, determining whether or not a predicted value corresponding to a

context of which all the pixels are white is white;

(d) if the result of determination at step (a) is affirmative, performing a first single line encoding process;

(e) if the result of determination at step (b) is negative, performing said first single line encoding process;

(f) if a result of determination at step (c) is negative, performing said first single line encoding process; and

(g) if the result of determination at step (c) is affirmative, performing a second single line encoding process.

7. The computer program product according to claim 6,

wherein said first single line encoding process comprises the steps of:

(d-1) forming a context for each pixel in a target line;

(d-2) reading from a probability estimation table a range width for prediction-miss which corresponds to the context formed at step (d-1);

(d-3) updating a range width showing probability that combination of white and black appears using said range width for prediction-miss;

(d-4) predicting a value of each pixel in said target line on the basis of the context corresponding to the pixel;

(d-5) if the prediction is unsuccessful, performing a prediction-miss process for the pixel concerned; and

(d-6) if the prediction is unsuccessful, performing a normalization process for the pixel concerned.

8. The computer program product according to claim 7,

wherein first single line encoding process further comprises the steps of:

(d-7) if the prediction is successful, determining whether or not a normalization is necessary for each pixel in said target line;

(d-8) if a result of determination at step (d-7) is affirmative, performing a prediction-hit process for the pixel concerned; and

(d-9) if the result of determination at step (d-7) is affirmative, performing said normalization process for the pixel concerned.

9. The computer program product according to claim 6,

wherein said second single line encoding process comprises the steps of:

(g-1) forming a context of which all the pixels are white and which is common to the pixels in a target line;

(g-2) reading from a probability estimation table a range width for prediction-miss which corresponds to the context formed at step (g-1) ;

(g-3) updating a range width showing probability that combination of white and black appears using said range width for prediction-miss; and

(g-4) omitting to predict a value of each pixel in said target line.

10. The computer program product according to claim 9,

wherein said second single line encoding process further comprises the steps of:

(g-5) determining whether or not a normalization process is necessary for each pixel in said target line;

(g-6) if a result of determination at step (g-5) is affirmative, performing a prediction hit process for the pixel concerned; and

(g-7) if the result of determination at step (g-5) is affirmative, performing said normalization process for the pixel concerned.

11. An apparatus for encoding image data in conformity with Joint Bi-level Image Group system, comprising:

(a) means for determining whether or not a typical prediction should be performed;

(b) means, if a result of determination by means (a) is negative, for determining whether or not all the pixels in a region composed of lines including pixels constituting a context are white;

(c) means, if a result of determination by means (b) is affirmative, for determining whether or not a predicted value corresponding to a context of which all the pixels are white is white;

(d) means, if the result of determination by means (a) is affirmative, for performing a first single line encoding process;

(e) means, if the result of determination by means (b) is negative, performing said first single line encoding process;

(f) means, if a result of determination by means (c) is negative, for performing said first single line encoding process; and

(g) means, if the result of determination by means (c) is affirmative, for performing a second single line encoding process.

12. The apparatus according to claim 11,

wherein said first single line encoding process comprises the steps of:

(d-1) forming a context for each pixel in a target line;

(d-2) reading from a probability estimation table a range width for prediction-miss which corresponds to the context formed at step (d-1);

(d-3) updating a range width showing probability that combination of white and black appears using said range width for prediction-miss;

(d-4) predicting a value of each pixel in said target line on the basis of the context corresponding to the pixel;

(d-5) if the prediction is unsuccessful, performing a prediction-miss process for the pixel concerned; and

(d-6) if the prediction is unsuccessful, performing a normalization process for the pixel concerned.

13. The apparatus according to claim 12,

wherein first single line encoding process further comprises the steps of:

(d-7) if the prediction is successful, determining whether or not a normalization is necessary for each pixel in said target line;

(d-8) if a result of determination at step (d-7) is affirmative, performing a prediction-hit process for the pixel concerned; and

(d-9) if the result of determination at step (d-7) is affirmative, performing said normalization process for the pixel concerned.

14. The apparatus according to claim 11,

wherein said second single line encoding process comprises the steps of:

(g-1) forming a context of which all the pixels are white and which is common to the pixels in a target line;

(g-2) reading from a probability estimation table a range width for prediction-miss which corresponds to the context formed at step (g-1) ;

(g-3) updating a range width showing probability that combination of white and black appears using said range width for prediction-miss; and

(g-4) omitting to predict a value of each pixel in said target line.

15. The apparatus according to claim 14,

wherein said second single line encoding process further comprises the steps of:

(g-5) determining whether or not a normalization process is necessary for each pixel in said target line;

(g-6) if a result of determination at step (g-5) is affirmative, performing a prediction hit process for the pixel concerned; and

(g-7) if the result of determination at step (g-5) is affirmative, performing said normalization process for the pixel concerned.